

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
16 June 2005 (16.06.2005)

PCT

(10) International Publication Number
WO 2005/054120 A3

(51) International Patent Classification⁷: **B22F 9/18**
(21) International Application Number:
PCT/US2004/040826
(22) International Filing Date: 6 December 2004 (06.12.2004)
(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
60/527,233 5 December 2003 (05.12.2003) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

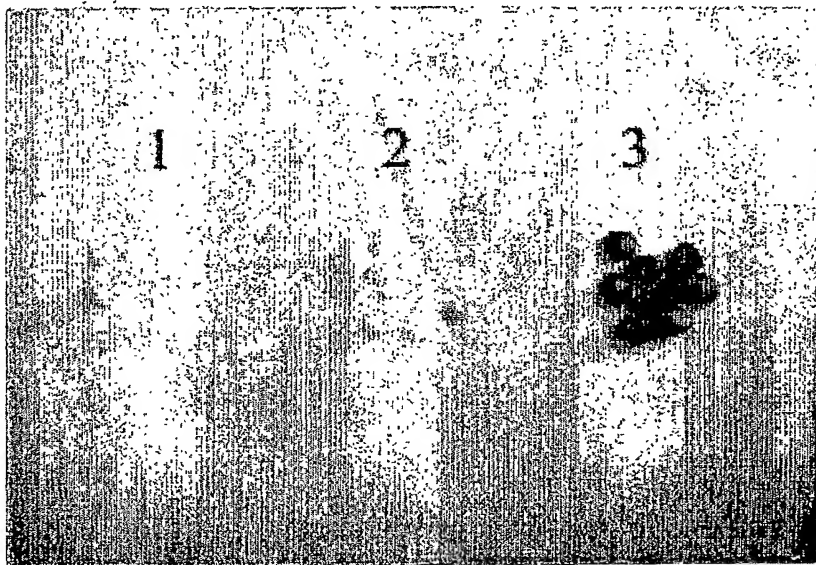
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: POLYMER-SUPPORTED METAL NANOPARTICLES AND METHOD FOR THEIR MANUFACTURE AND USE



(57) Abstract: A method for making polymer-supported metal nanoparticles (3) is disclosed comprising providing a polymer support material (1), contacting the support with a metal nanoparticle or metal nanoparticle precursor (2), and contacting the support material and metal or metal precursor with a fluid that swells the support material sufficiently to allow the metal or precursor to diffuse into the support material. The method also may comprise reducing the metal of the metal precursor to provide a metal nanoparticle. Typically, the support material is a plastic. The metal can be various metals including palladium, rhodium, platinum, iridium, osmium, gold, nickel, iron or combinations thereof. The nanoparticles can comprise alloys or aggregates of two or more metals. The fluid can be

any fluid that facilitates polymer swelling, one example being supercritical carbon dioxide. A method for performing chemical reactions comprises providing a polymer-supported metal nanoparticle and selected reagents under conditions allowing chemical reactions to occur. The method may involve reducing or oxidizing sites of unsaturation or functional groups. Relative amounts of the reduction products can be varied by selecting an appropriate metal nanoparticle, polymer support material, or both.

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(88) Date of publication of the international search report:

4 August 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.